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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,753	04/02/2004	Chuanfu Wang	BYD-US2003-003	1131
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EMIL CHANG LAW OFFICES OF EMIL CHANG 874 JASMINE DRIVE SUNNYDALE, CA 94086			EXAMINER SEIFU, LESSANWORK T	
			ART UNIT	PAPER NUMBER
			1709	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/816,753

Applicant(s)

WANG ET AL.

Examiner

Lessanework T. Seifu

Art Unit

1709

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04/02/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04/02/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-2, 7-12, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fay, III et al, US 6,040,266 (US '266).

Regarding claim 1, the reference US '266 discloses a foam catalyst/baffle structure placed in a metal can, having an input port and an output port (see column 6, last paragraph), it further states that the foam structure can be of a ceramic or metallic foam substrate (see column 3 lines 43-47). The reference also further discloses the acoustic baffle/catalyst support having a pore density of sixty five to ninety five percent voids (see last sentence of the Abstract or claim 16). Applicants' claimed limitation to specific pore density and pore diameters are not patentable distinctions because, it is within the level of ordinary skill in the art to select pore density and pore diameter optimized to achieve the highest conversion rate and to lowest pressure drops for a specific application.

Regarding claim 2, as stated above, applicants' claimed limitation to specific pore density and pore diameters are not patentable distinctions because, it is within the level of ordinary skill in the art to select pore density and pore diameter optimized to achieve the highest conversion rate and to lowest pressure drops for a specific application.

Regarding claim 7 and 11, the reference US '266 discloses a foam catalyst/baffle structure with an outer can having an input port to receive exhaust gas from the motor and an output port to expel the exhaust gas (see Fig. 2). From the above disclosure person having ordinary skill in the art would construe the ports to include pipes for means of receiving and expelling the exhaust gas. Regarding the exhaust flows, again see Fig. 2 or column 7 lines 2-5 of the reference US '266 the reference shows the direction of exhaust flow is from the input port to the output port. Regarding the baffle/s position and arrangement as described in the respective claims 7 and 11 above, the reference US '266 discloses that various geometric arrangement and modification to the foam shape can be made that are suitable for exhaust sound suppression depending on the applications to be used (see column 5, lines 6-21 and column 6, lines 50-56). Therefore, as taught by the reference US '266, applicants' further limitations in claims 7 and 11 pertaining to the baffle's shape and geometrical arrangement is not a patentable distinction, because applicants have not shown that the claimed limitations display unexpected results.

Regarding claims 8-10 and 12, the reference US '266 discloses that various geometric arrangement and modification to the foam shape can be made that are suitable for exhaust sound suppression depending on the applications to be used (see column 5, lines 6-21 and column 6, lines 50-56). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the catalyst/baffle structure in the reference US '266 to any shape and size including what is

claimed, to obtain an optimum level of noise reduction because the reference US '266 teaches that various geometric arrangement and modification to the foam shape can be made that are suitable for exhaust sound suppression depending on the applications to be used. Therefore, as thought by the reference US '266, applicants' further limitations by the above claims pertaining to the baffle's shape and geometrical arrangement is not a patentable distinction, because applicants have not shown that the claimed limitations display unexpected results.

Regarding claim 18, reference US '266 discloses a foam catalyst/baffle structure placed in a metal can, having an input port and an output port (see column 6, last paragraph), it further states that the foam structure can be of a ceramic or metallic foam substrate (see column 3 lines 43-47). The reference also further discloses the acoustic baffle/catalyst support having a pore density of sixty five to ninety five percent voids (see last sentence of the Abstract or claim 16). Applicants' claimed limitation to specific pore density and pore diameters are not patentable distinctions because, it is within the level of ordinary skill in the art to select pore density and pore diameter optimized to achieve the highest conversion rate and to lowest pressure drops for a specific application.

5. Claims 3-4, 15-17, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US '266 as applied to claims 1-2, 7-12, and 18 above, and further in view of Graham et al, US 5,937,641 (US '641).

Regarding claim 3 the reference US '266 discloses a metallic foam substrate. The reference is silent in regards to the make up of the metallic foam substrate that can be used in the invention. The reference US '641 discloses a catalytic converter having a catalytic core element comprising a rigid, foam-like, metallic material (see column 2, lines 43-47). The reference US '641 further discloses that the foam-like, metallic material can be formed from metals comprising the claimed groups of metals (see column 3, lines 4-12). The reference US '641 further teaches that those groups of metals and others disclosed in the reference are capable of withstanding the thermal stresses and vibrations encountered in typical exhaust installations and applications (see column 3 lines 22-26). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used metals including those groups of metals claimed, as element of the metallic foam substrate for the foam catalyst/baffle structure in the reference US '266, because the metals have characteristics that withstand thermal stress and vibrations.

Regarding claim 4, the reference US '266 discloses a metallic foam substrate. The reference is silent in regards to the composition of the metallic foam substrate. The reference US' 641 teaches an embodiment of a foam-like metallic material formed from metal alloy comprising aluminum, chromium and iron, and the metal alloy further comprising titanium, chromium, cobalt, molybdenum and other precious metal (see column 5, lines 33-50). As discussed above the reference US '641 further teaches that

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the above groups of metals and others disclosed in the reference are capable of withstanding the thermal stresses and vibrations encountered in typical exhaust installations and applications (see column 3, lines 22-26). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used metals including those groups of metals claimed, as element of the metallic foam substrate for the foam catalyst/baffle structure in the reference US '266, because the metals disclosed by the reference US '641 have characteristics that withstand thermal stress and vibrations.

Applicant's claimed limitation of the components percentage composition is not a patentable distinction because it is within the level of ordinary skill in the art to select any percentage combination from the above-disclosed elements including those described in the claim that will yield an effective core substrate. Applicants have not shown that the claimed component composition displays unexpected result.

Regarding claim 15, the reference US '266 discloses that the foam catalyst support acts as a bulk acoustic absorber for providing noise reduction (see column 4, lines 35-32). The reference US '641 discloses a foam-like metallic core element in which the metallic walls define an open pattern of micronically sized interconnected pores (see column 5, lines 1-5). The reference US '641 is silent regarding the use of porous metallic core element as sound absorption material.

It would have been obvious for person having ordinary skill in the art at the time the invention was made to have combined the teaching of the reference US '266 and the reference US '641 and use the foam-like metallic core element as a sound absorption material, because the reference US 266 teaches that the metallic foam substrate can be used as a catalyst support material as well as bulk acoustic absorber for sound reduction. Applicants' claimed limitation to specific pore density and pore diameters are not patentable distinctions because, it is within the level of ordinary skill in the art to select pore density and pore diameter optimized to achieve the highest sound reduction level and to lowest pressure drops for a specific application.

Regarding claims 16-17, the reference US '266 discloses that the metallic foam substrate acts as a bulk acoustic absorber for providing noise reduction (see column 4, lines 35-32), but the reference is silent in regards to the composition of the metallic substrate. The reference US '641 discloses that the foam-like metallic core element can be formed from metals alloys comprising nickel, iron, aluminum, titanium, chromium, cobalt, and molybdenum (see column 5, lines 33-50). The above disclosure meets the limitations in claim 16 and 17. The reference US '641 further teaches that those groups of metals and others disclosed in the reference are capable of withstanding the thermal stresses and vibrations encountered in typical exhaust installations and applications (see column 3 lines 22-26). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used metals including those groups of metals claimed, as element of the metallic foam substrate for the foam catalyst/baffle

structure in the reference US '266, which by disclosure of reference US '266 provide noise reduction, because the above disclosed metals have characteristics that withstand thermal stress and vibrations.

Applicant's claimed limitation of the components percentage composition is not a patentable distinction because it is within the level of ordinary skill in the art to select any percentage combination from the above-disclosed elements including those claimed that will yield an effective core substrate that can withstand thermal stress and vibrations. Applicants have not shown that the claimed component composition displays unexpected result.

Regarding claim 19, the reference US '266 discloses a metallic foam substrate, but it is silent in regards to the composition of the metallic foam substrate that can be used in the invention. The reference US '641 discloses a catalytic converter having a catalytic core element comprising a rigid, foam-like, metallic material (see column 2, lines 43-47). The reference US '641 further discloses that the foam-like, metallic material can be formed from an alloy comprising the claimed groups of metals. The reference US '641 further teaches that those groups of metals and others disclosed in the reference are capable of withstanding the thermal stresses and vibrations encountered in typical exhaust installations and applications (see column 3 lines 22-26). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used metals including those groups of metals claimed, as

element of the metallic foam substrate for the foam catalyst/baffle structure in the reference US '266 because the metals have characteristics that withstand thermal stress and vibrations.

Regarding claim 20, the reference US '641 discloses that the foam-like metallic core element can be formed from metals alloys comprising nickel, iron, aluminum, titanium, chromium, cobalt, and molybdenum (see column 5, lines 33-50). The above disclosure meets the limitations in claim 20. Applicant's claimed limitation of the components percentage composition is not a patentable distinction because it is within the level of ordinary skill in the art to select any percentage combination from the above-disclosed elements including those claimed that will yield an effective core substrate. Applicants have not shown that the claimed component composition displays unexpected result.

6. Claims 5, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over US '266 as applied to claims 1-2, 7-12, and 18 above, and further in view of Barber et al, US 3,884,037 (US '037).

Regarding claim 5, the reference US '266 is silent regarding the volume of the muffler/catalytic converter. The reference US '037 describes an acoustic catalytic muffler and in the disclosure it describes that the limits for the size of the exhaust system are dependent upon engine displacement. It further discloses that the ratio of

the total volume of the catalytic muffler device to the engine displacement is 1.5 to 3.4 (see column 8, lines 55-61). The above disclosures are within the claim limitation of claim 5. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the teaching of reference US '266 and reference US '037 and modify the volume of the exhaust system in the reference US '266 in relation to engine displacement because, the reference US '037 teaches that for optimum catalytic reaction the volume of the exhaust system is dependent upon engine displacement.

Regarding claim 13, the reference US '266 does not disclose that the catalyst/baffle substrate is spiral shaped. The reference US '037 discloses that the porous material used in the catalytic muffler is twisted to a helical configuration (see column 5, lines 21-25 and 35-43). It would have been obvious to person having ordinary skill in the art at the time the invention was made to have modified the metallic foam substrate in reference US '266 in to a spiral shape, because the reference US '037 teaches that the helical configuration of the porous material used in the catalytic muffler in reference US '037 would provide increased turbulence leading to an increase in the catalytic reaction and better sound absorption effect (see column 5 lines 36-44).

Regarding claim 14, as mentioned earlier, the reference US '266 discloses that various geometric arrangement and modification to the foam shape can be made that are suitable for exhaust sound suppression depending on the applications to be used

(see column 5, lines 6-21 and column 6, lines 50-56). Therefore, applicants' further limitations to claim 13 pertaining to the baffle's thickness is not a patentable distinction, because applicants have not shown that the claimed limitations display unexpected results.

7. Claims 6 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over US '266 as applied to claims 1-2, 7-12, and 18 above, and further in view of Chen US 2003/0021745 A1 (US '745).

Regarding claim 6, as discussed earlier, the reference US '266 discloses that one embodiment of the acoustic baffle/catalyst foam support material is a porous metallic substrate (see column 4, lines 60-63) on which catalyst coating can be applied. The reference US '266 is silent in regards to the composition of the catalyst coating for the metallic substrate. Reference US '745 discloses catalyst composite useful for reducing contaminants in exhaust gas streams, the reference discloses a catalyst with a first layer composition with components selected from groups consisting of cerium, lanthanum, praseodymium, neodymium, platinum, palladium, rhodium, ruthenium, barium, potassium, sodium, and lithium; a second layer with components selected from groups consisting of manganese, calcium, magnesium, zinc and aluminum (see page 5, paragraph [0049] and page 18, paragraph [0244]). The limitations in claim 6 regarding the catalyst coating are met by the teachings in the reference US '745. It would have been obvious to one having ordinary skill in the art at the time the invention was made

to have used the catalyst composites disclosed in the reference US '745 as the catalyst layer composites on the porous metallic substrate of the reference US '266, because the reference US '745 teaches that the above disclosed catalyst composites are useful for reducing contaminants in exhaust gas streams.

Regarding claim 21, the reference US '266 discloses that one embodiment of the acoustic baffle/catalyst foam support material is a porous metallic substrate (see column 4, lines 60-63) on which catalyst coating can be applied. Reference US '745 discloses catalyst composite useful for reducing contaminants in exhaust gas streams, the reference discloses a catalyst with a first layer composition with components selected from groups consisting of cerium, lanthanum, praseodymium, neodymium, platinum, palladium, rhodium, ruthenium, barium, potassium, sodium, and lithium; a second layer with components selected from groups consisting of manganese, calcium, magnesium, zinc and aluminum (see column 9, lines 24-40 and column 32, lines 1-13 and lines 63-65). The limitations in claim 21 regarding the catalyst coating are met by the teachings in the reference US '745. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the catalyst composites disclosed in the reference US '745 as catalyst layer composites on the porous metallic substrate of the reference US '266, because the reference US '745 teaches that the above disclosed catalyst composite components are useful for reducing contaminants in exhaust gas streams.

8. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over US '266 as applied to claims 1-2, 7-12, and 18 above, and further in view of Barber et al, US 3,884,037 (US '037).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Currie, US 4,530,418.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lessanework T. Seifu whose telephone number is 571-270-3153. The examiner can normally be reached on Mon-Thr 7:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LS


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